

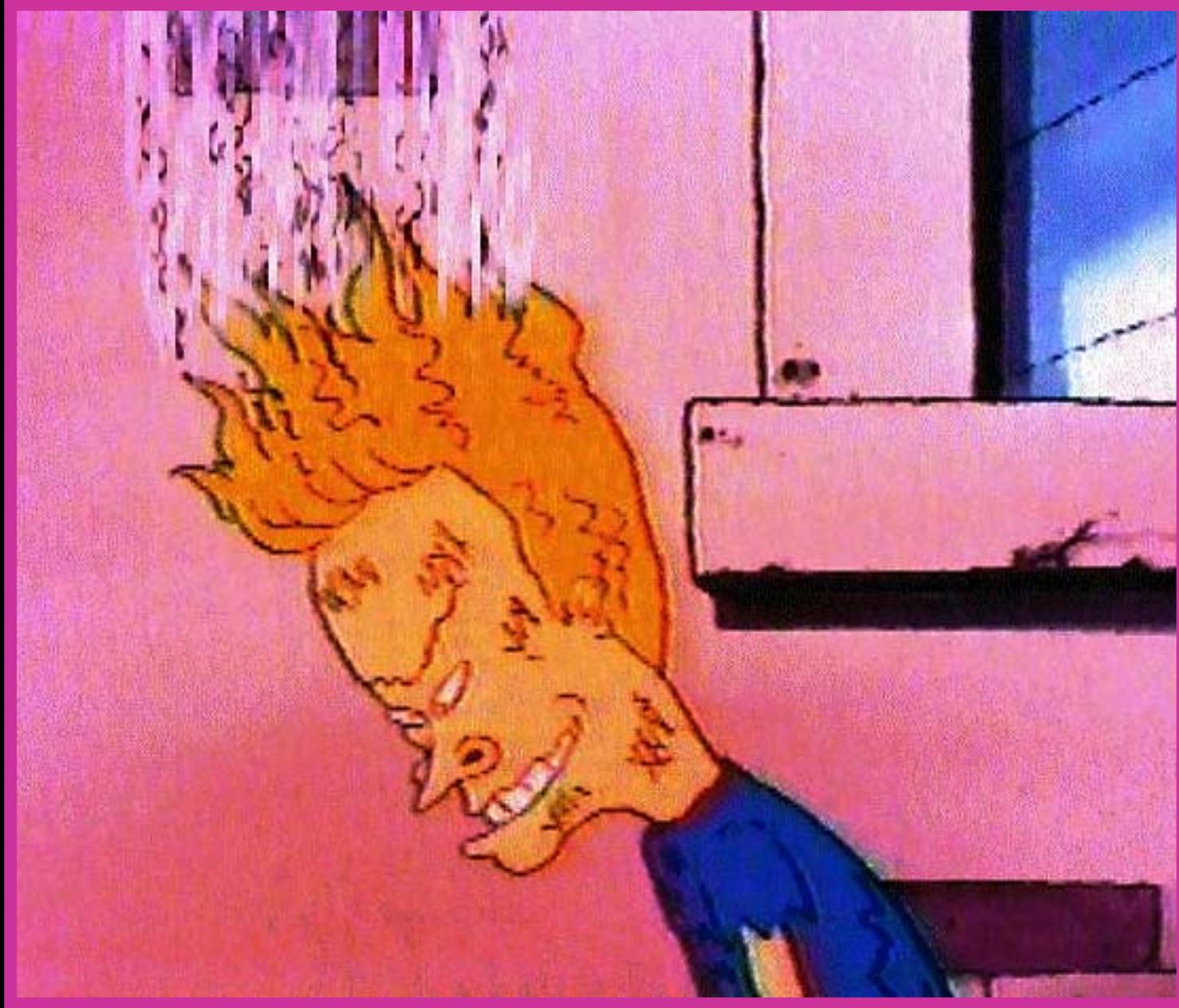
Big [and Old!] Trees:

Image from: <http://www.flamingpear.com/>



Fire Hoses for a Smoldering Climate

methods



treatments

fine tuning

Experimental Study of Eddy-Flux Measurements



and Tree-Ring Estimates of Growth

a biometric study indicates that red oak accounts
for 50 to 70% of above-ground woody increment
[uh, radial growth-rings - tree-rings]





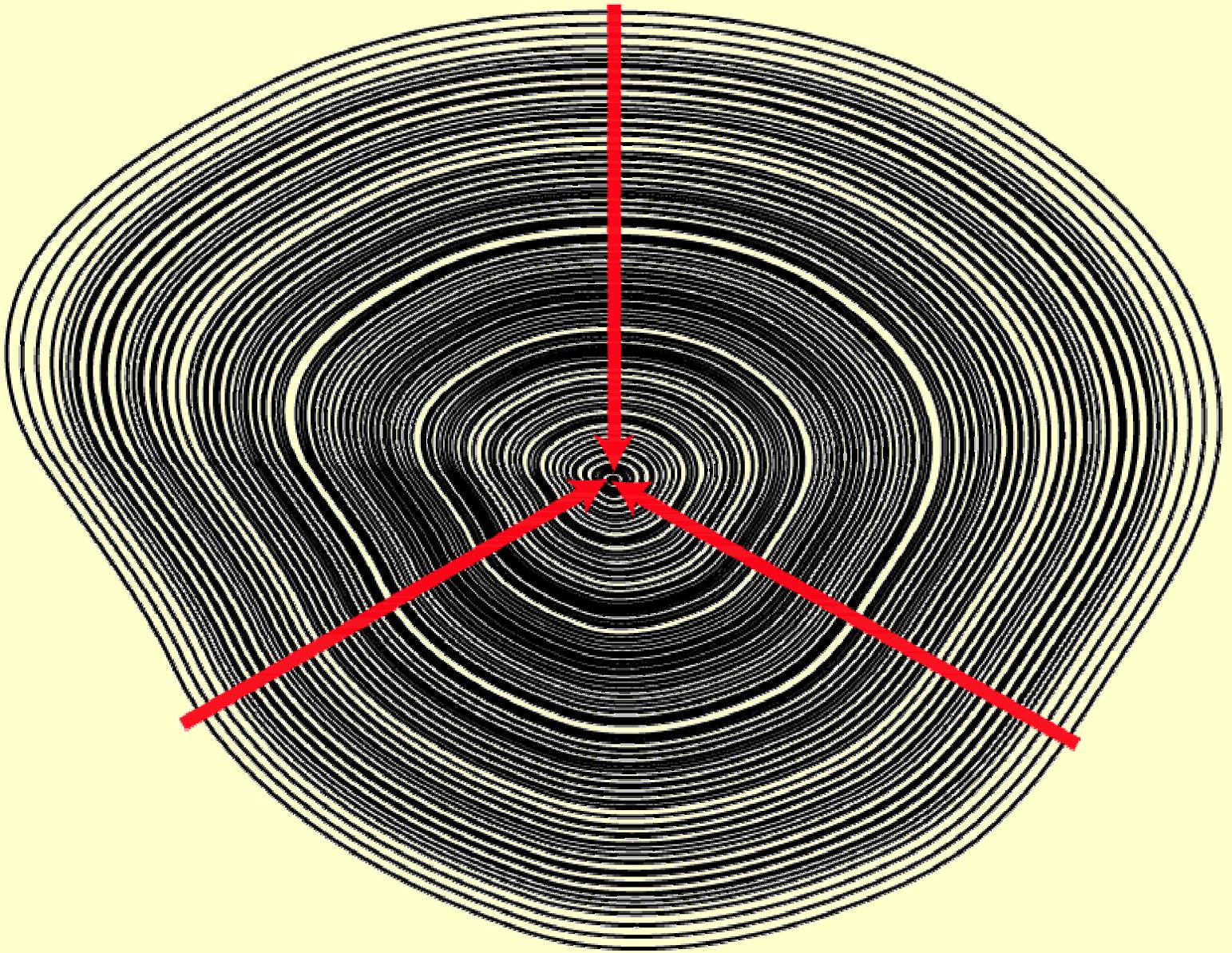
goals

place uptake in a long-term perspective

importance of drought, gypsy moth

how typical is the harvard forest forest?

methods

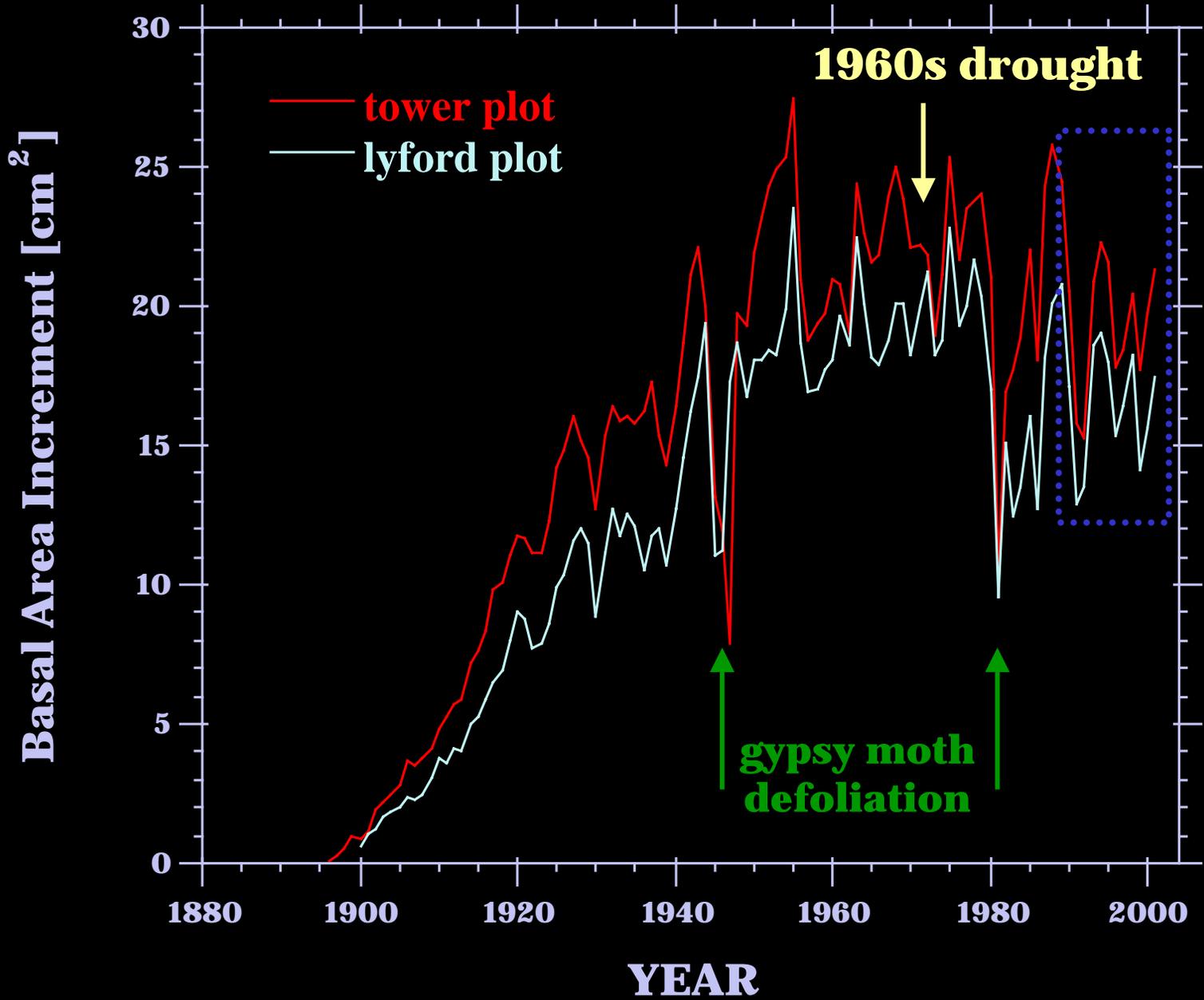


- 35 trees/stand, 3 cores/tree
- measured to +/- 0.001 mm

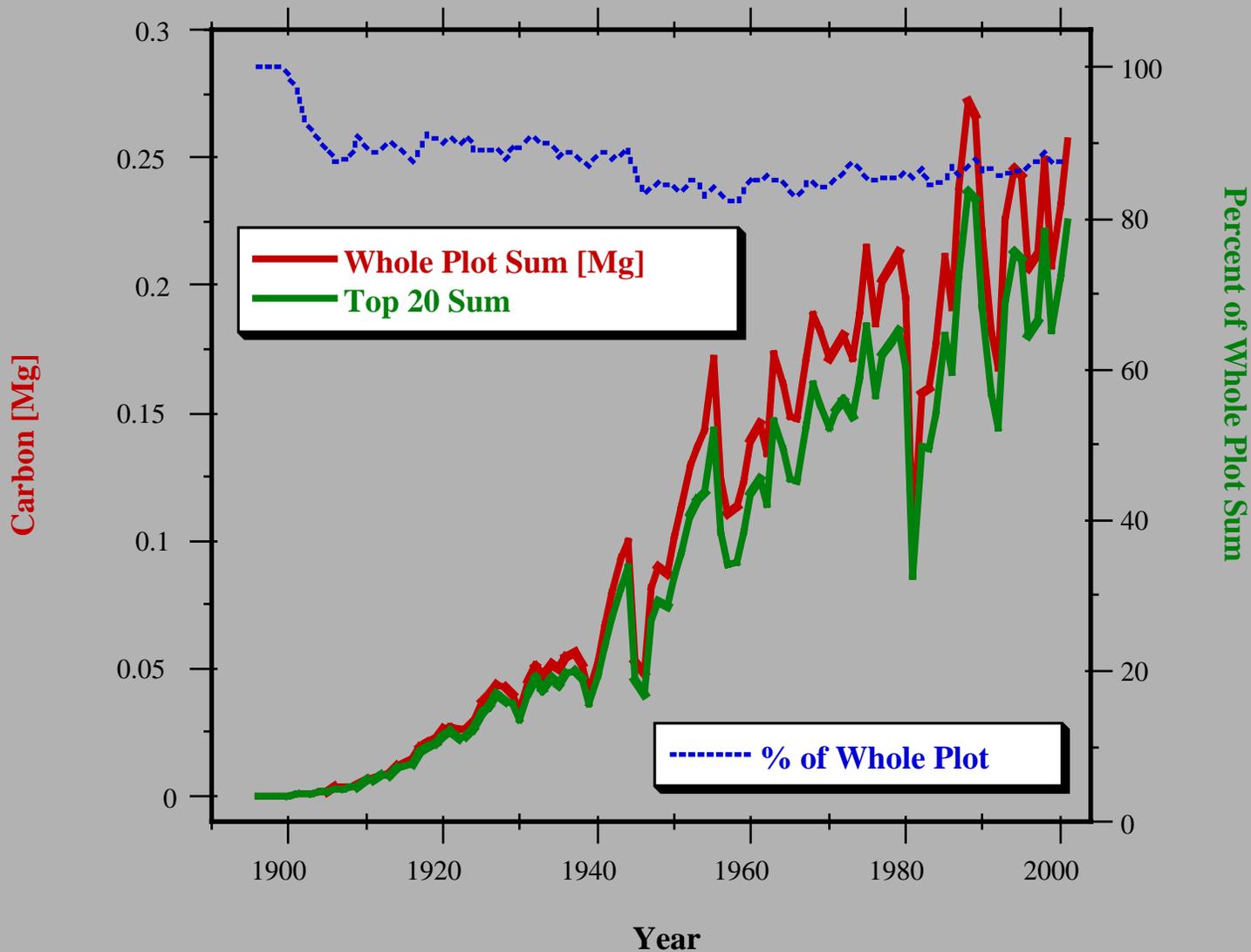
- convert rings to BAI [biomass]
- compare to regional red oak

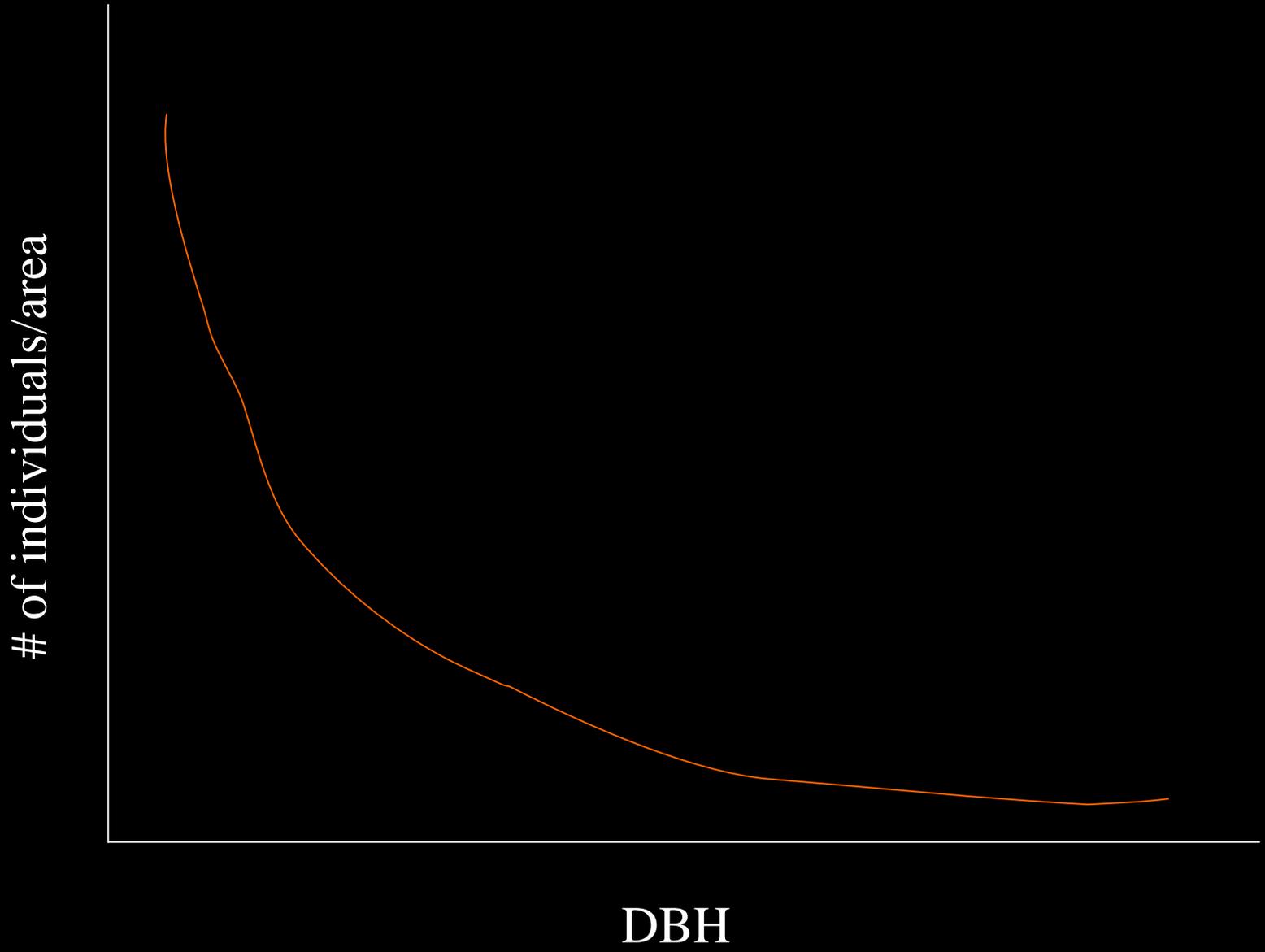


decreasing ring widths



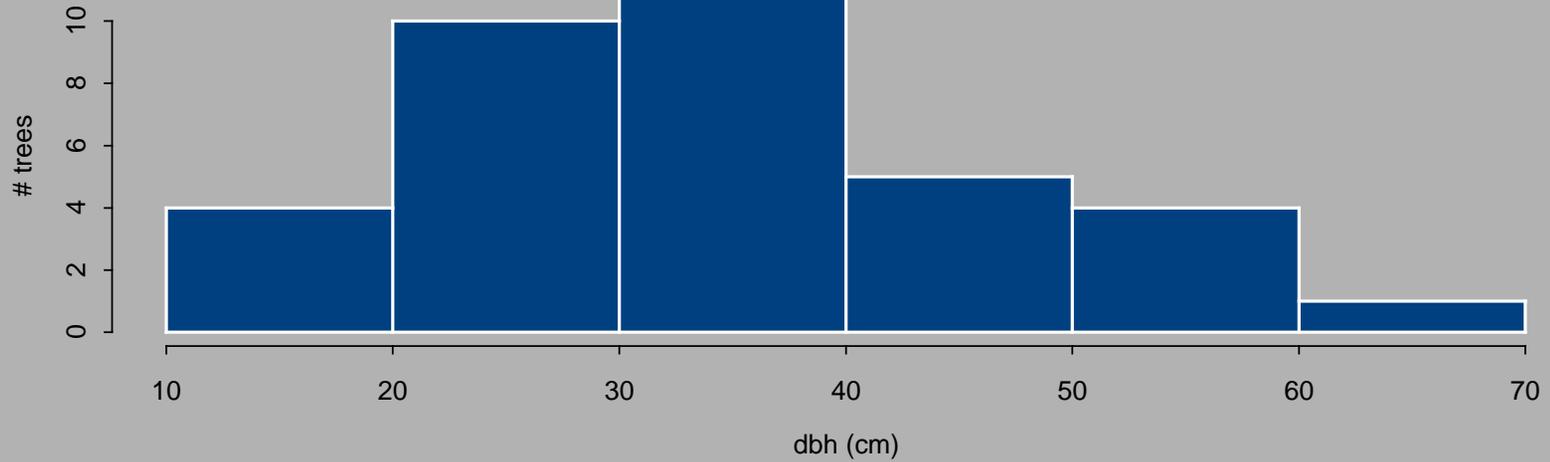
HF Red Oak Accum Increment



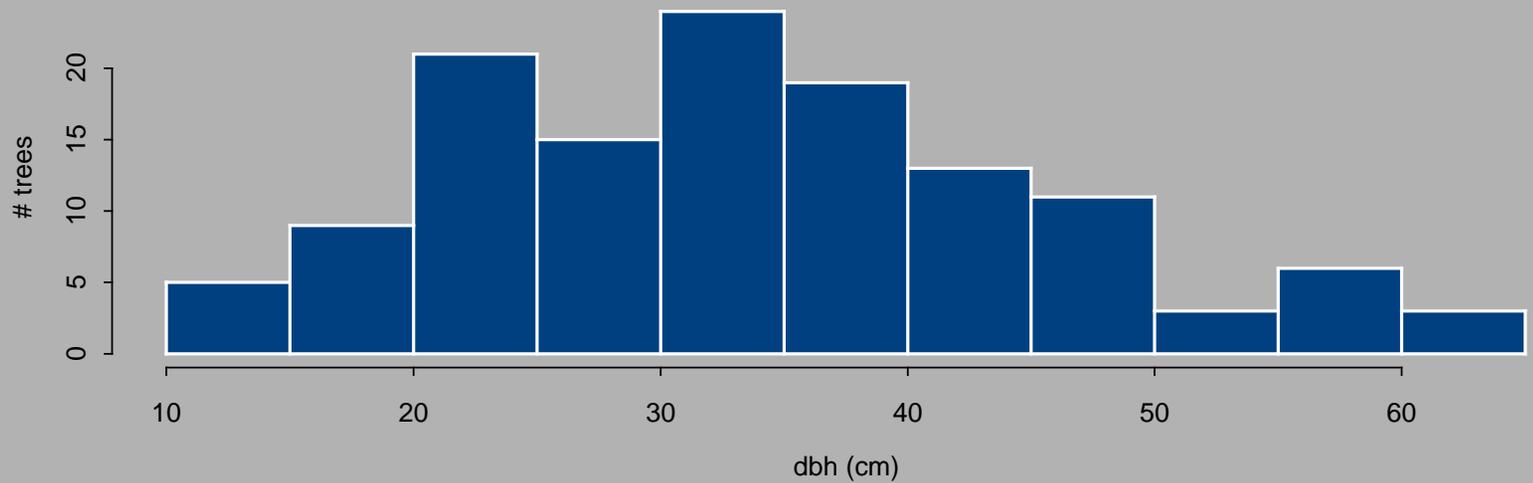


harvard forest tower plot red oak

diameter distribution of cored oaks



diameter distribution of all oaks



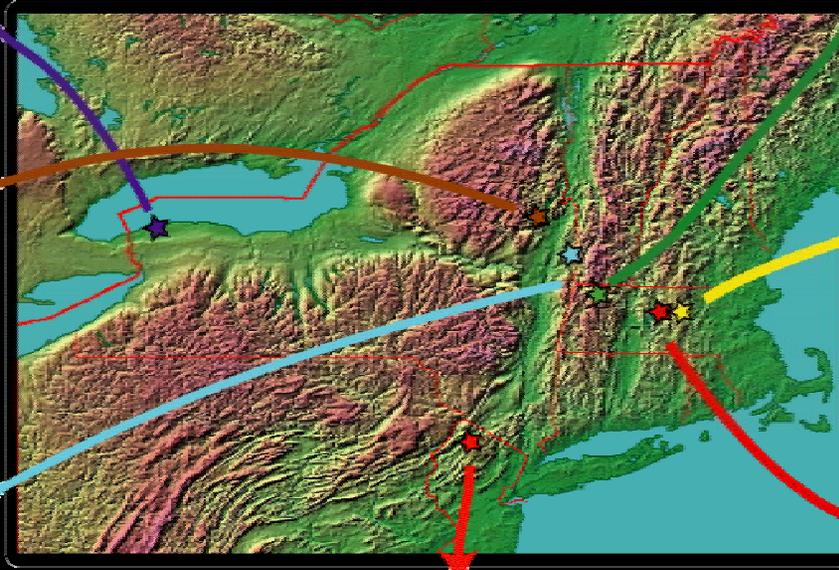
Singer Farm, NY



Mohawk Trail State Forest, MA



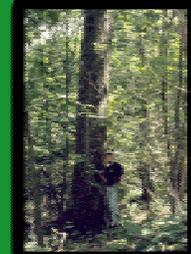
regional red oak



Prospect Mtn., NY



Wachusett Mtn., MA



Goose Egg, NY

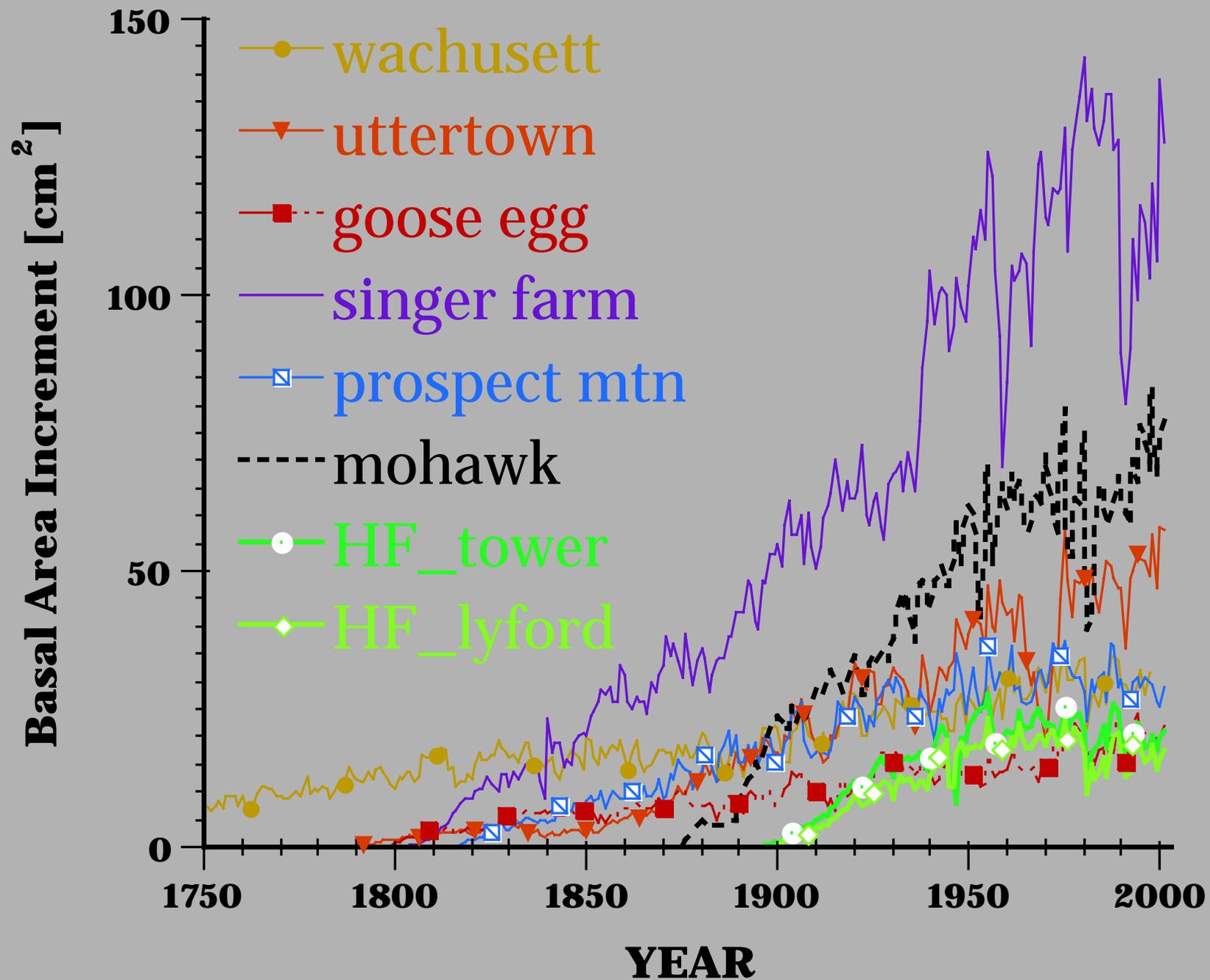


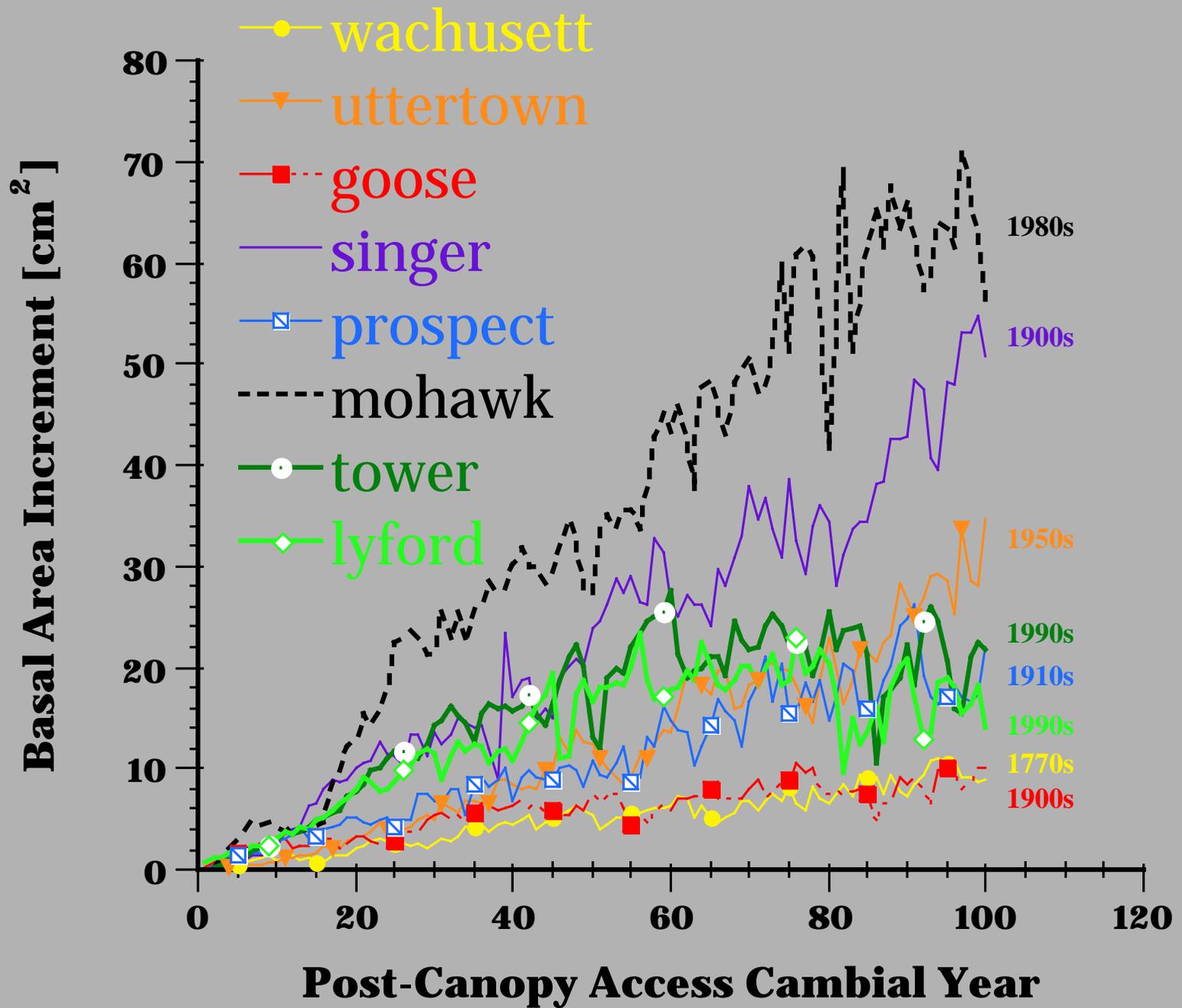
Uttertown, NJ

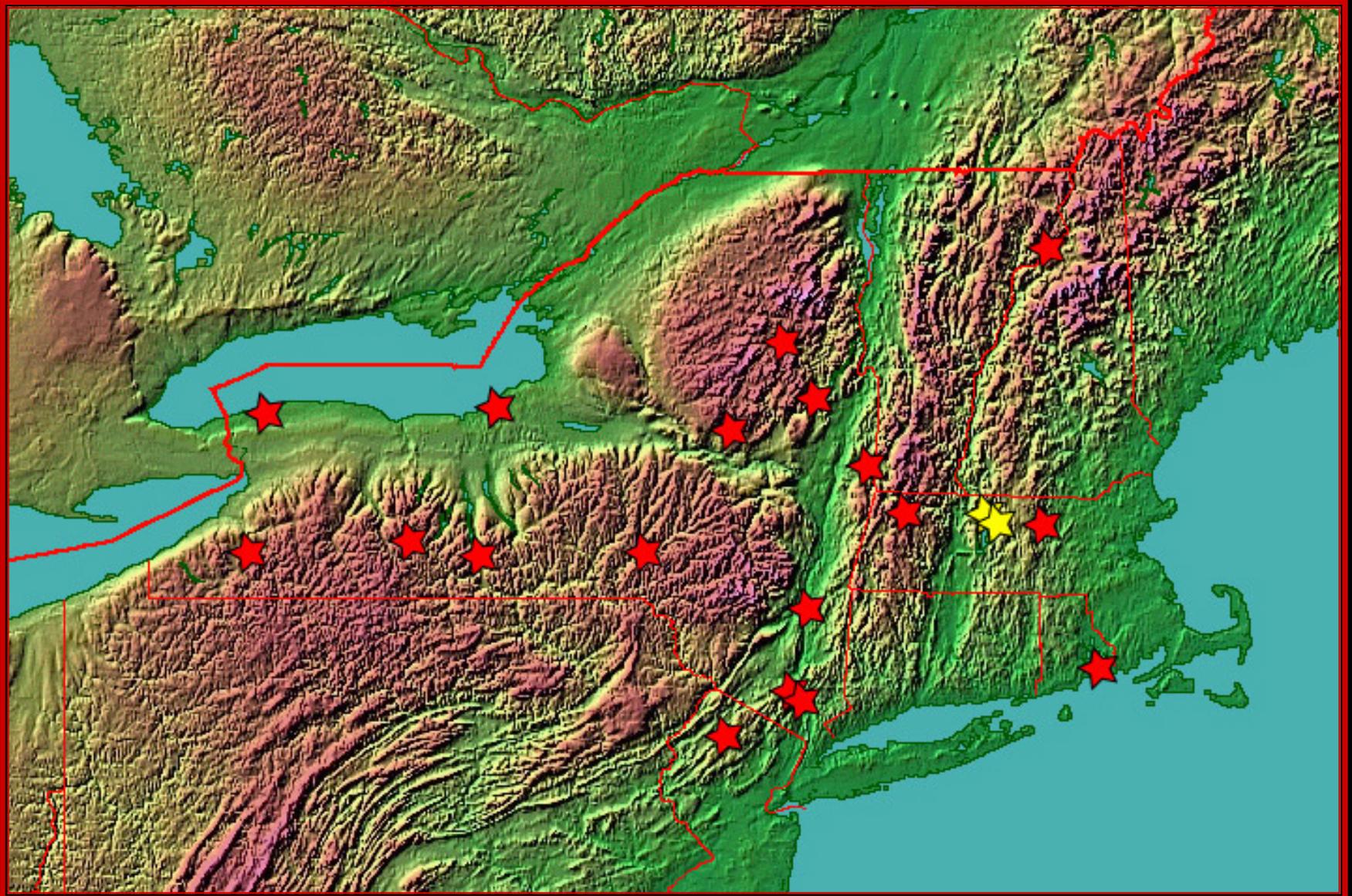


Harvard For., MA









Recent Growth Increases of Northern Range Margin Trees



pitch pine



tulip-poplar



**chestnut
oak**



**pignut
hickory**



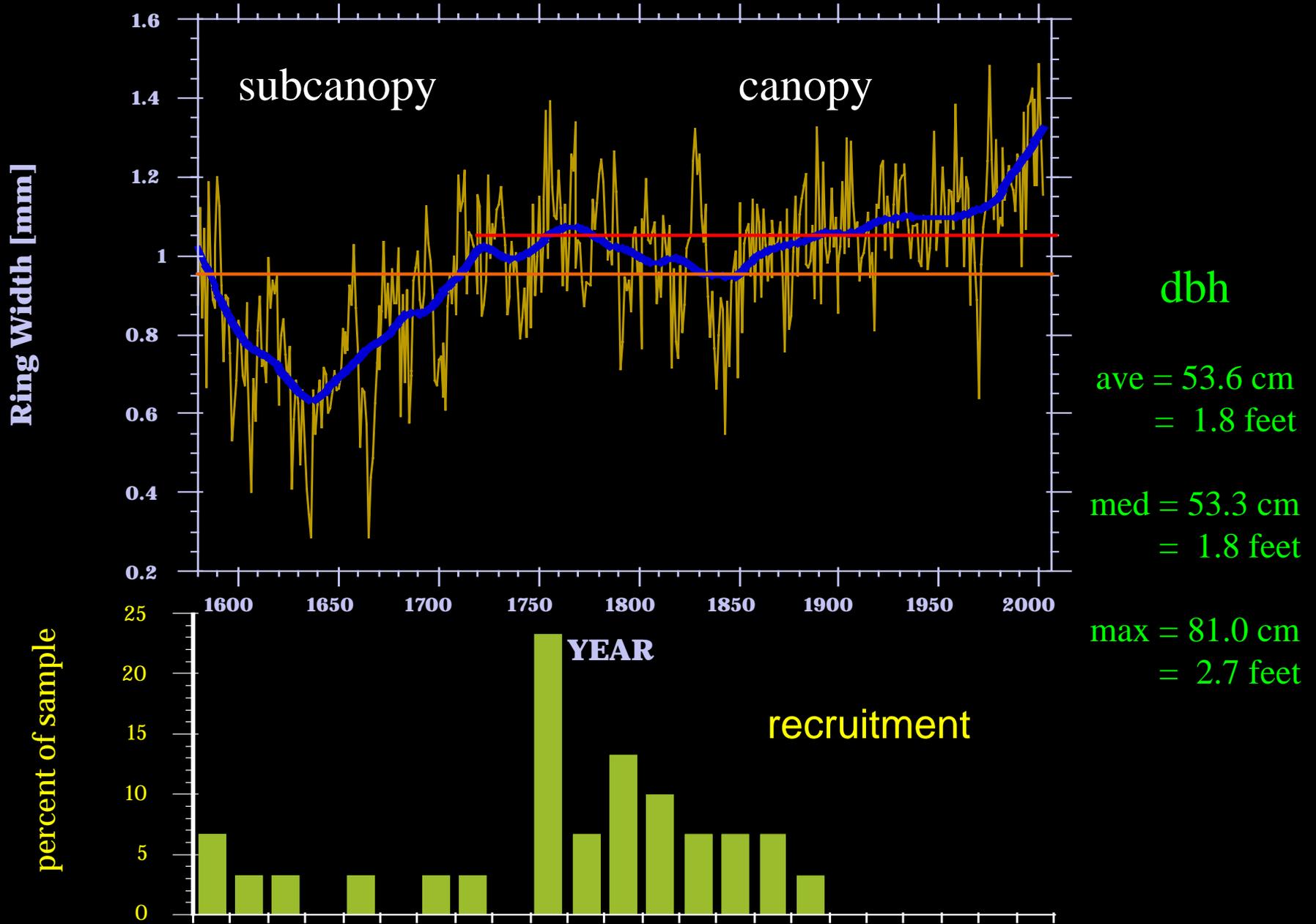
**Tree-Ring Lab,
Lamont-Doherty
Earth Observatory**



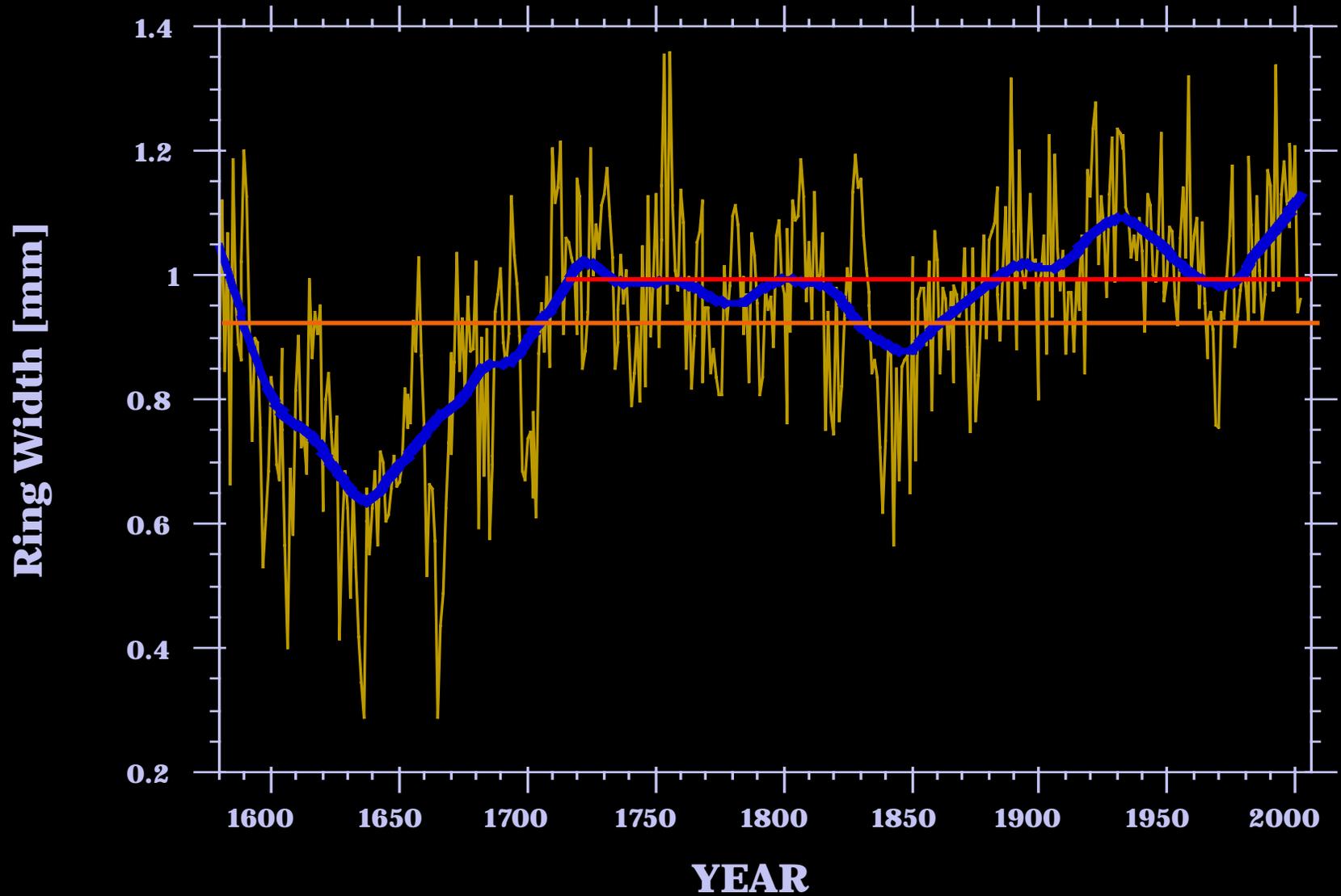


uttertown, nj

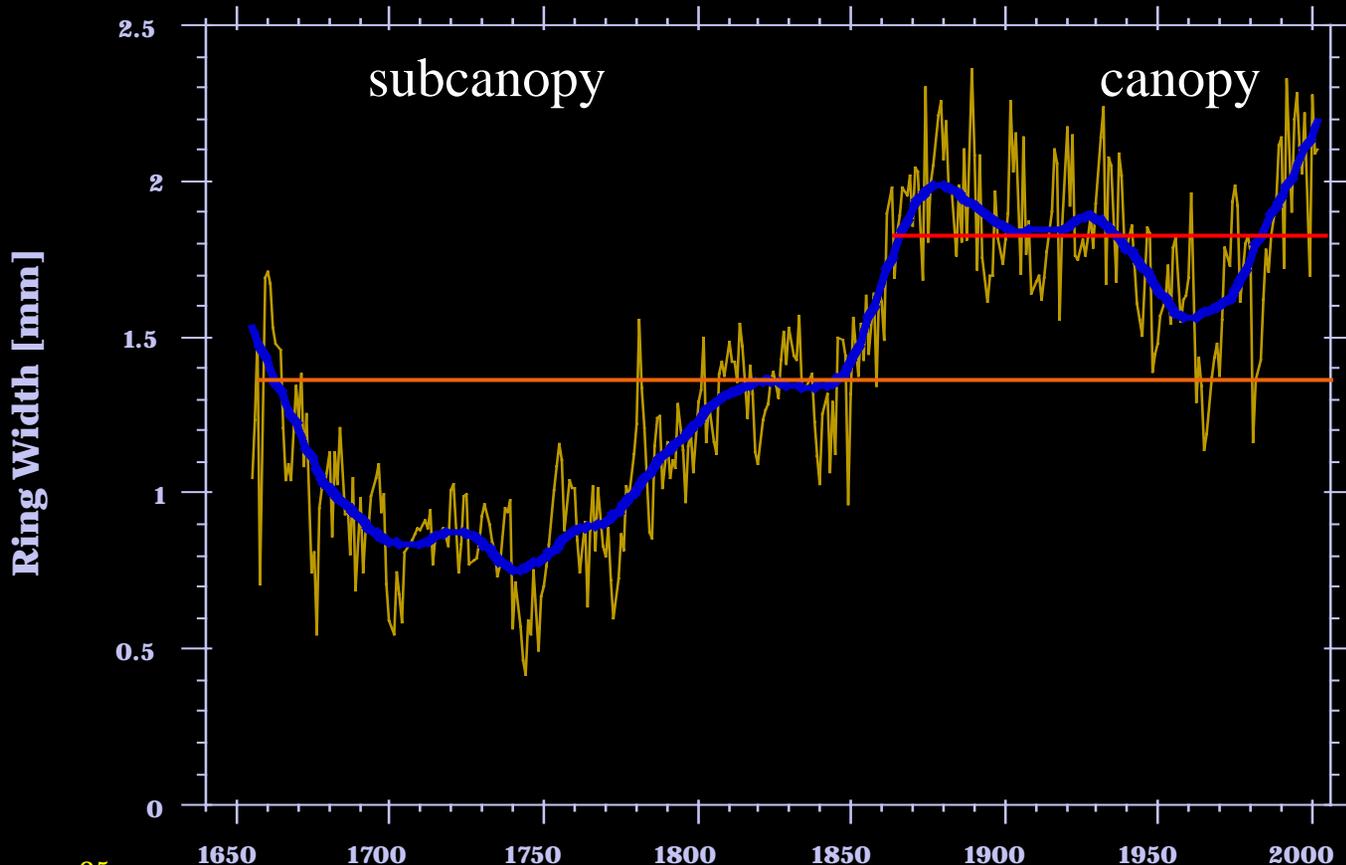
Uttertown Chestnut Oak



Uttertown Chestnut Oak Oldies



Mohonk Chestnut Oak



dbh

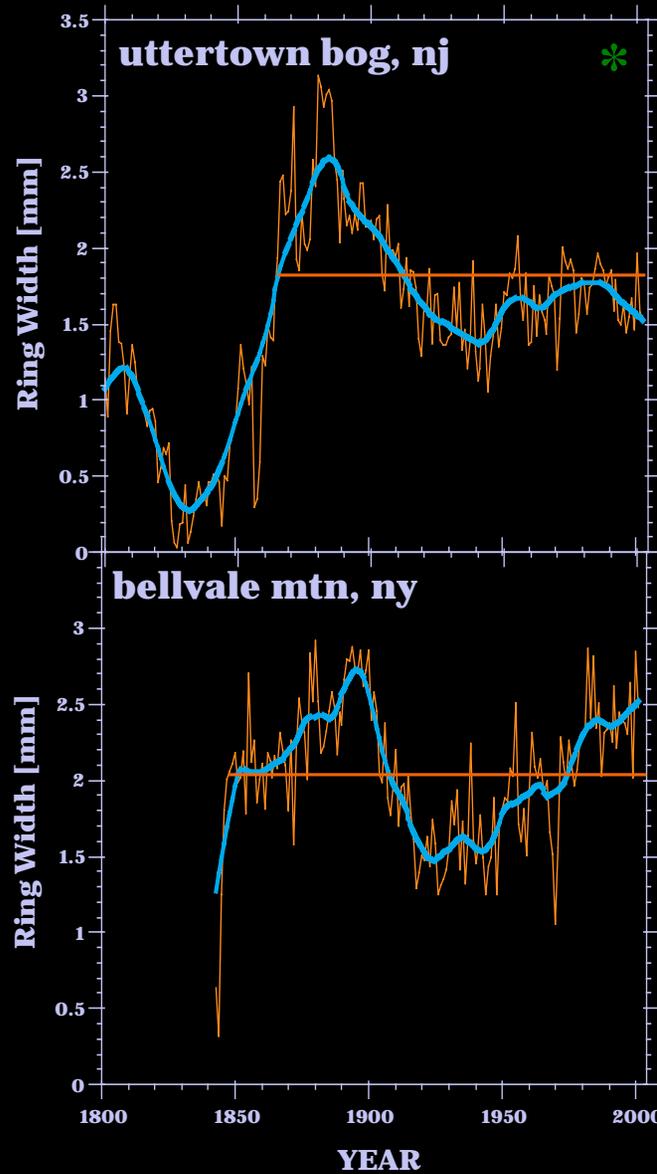
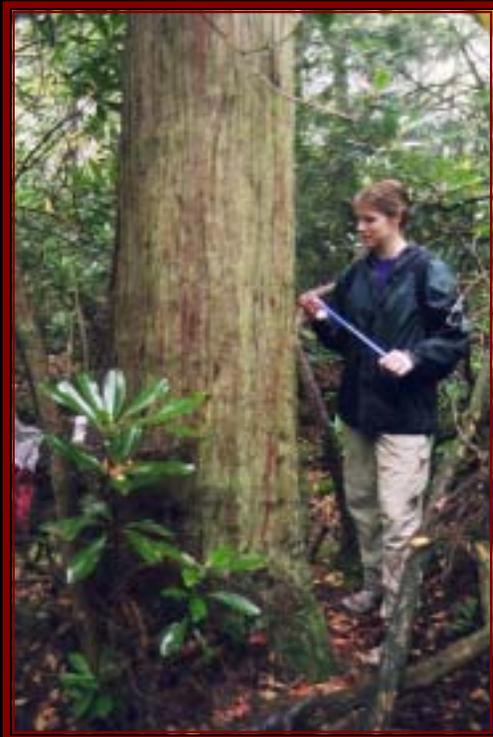
ave = 64.9 cm
= 2.1 feet

med = 67.3 cm
= 2.2 feet

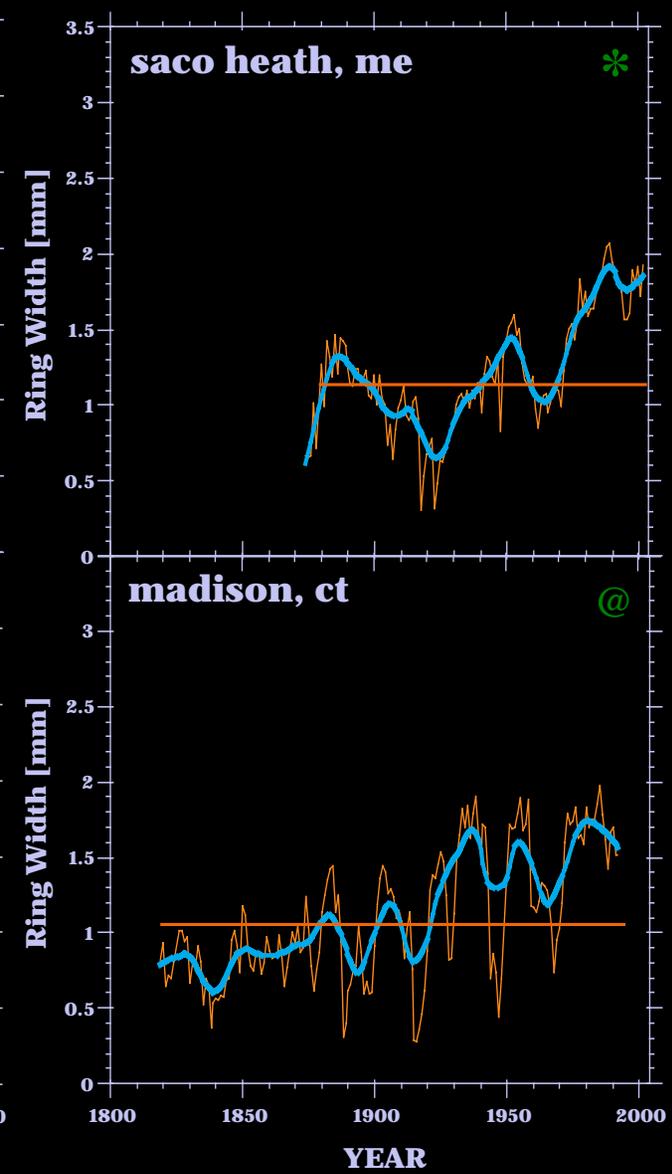
max = 85.9 cm
= 2.8 feet



7 of 10 AWC sites from NJ-ME have above average raw rings width



high point state park, nj



* - data courtesy of M. Hopton
 @ - samples courtesy of T. Siccama
 - in Hopton & Pederson, in review

Atlantic white-cedar, chestnut oak, white oak, & pignut hickory -

most consistent increases in ave. raw ring width

cored @ 4.1
m above root
collar

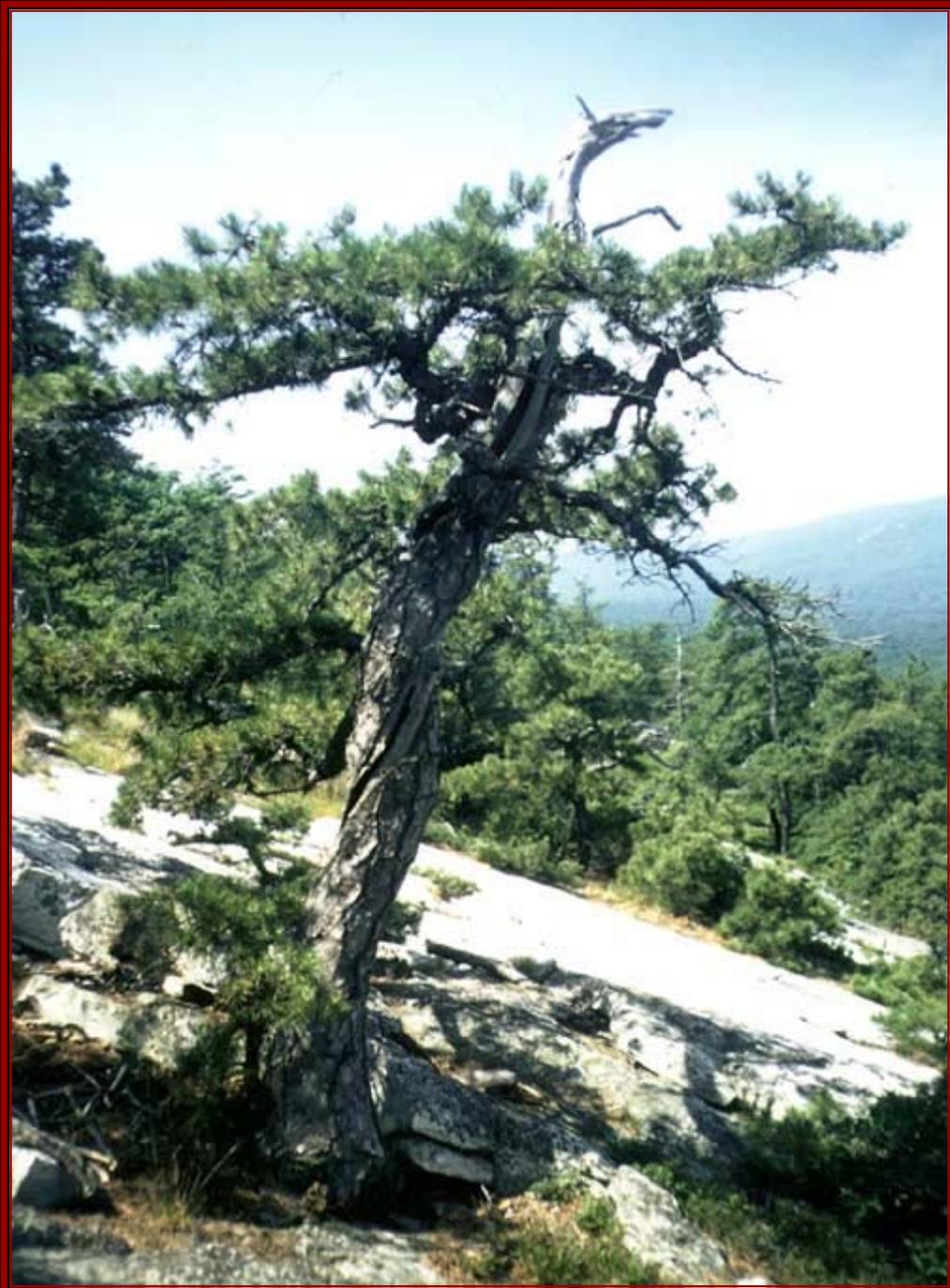
425 yr old
chestnut oak

uttertown,
nj



implications

- Carbon: - Nemani et al. [2003] - since 1982, \uparrow primary production
- evidence here indicates substantial increase in growth over last 30, 70, 100+ years
- Exo. factors: - disturbance & climate important
- N & CO₂?



pitch pine, mohonk preserve, ny

big trees: - grow fast!!
- take up large amounts of C

longevity: - age a limit to growth?

future work

study these species from mid-range → north

determine causes of increased growth





Dr.
Les
Lynn



Acknowledgements

